Parallels Virtuozzo Containers 4.7 for Linux

Upgrade Guide

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CHAPTER 1

About This Document

This document familiarizes you with the way to upgrade the following products to Parallels Virtuozzo Containers 4.7 for Linux:

- Parallels Virtuozzo Containers 4.0 and 4.6
- SWsoft Virtuozzo 3.0 Service Pack 1
- OpenVZ

Note: Upgrading from the Beta version of Parallels Virtuozzo Containers 4.7 is not supported.

CHAPTER 2

Upgrade Scenarios

Before beginning the upgrade process, it is important to choose the proper upgrade scenario. Doing so will help you avoid difficulties you may otherwise encounter and will also ensure you can successfully solve any problems that may still occur. You can use one of the following scenarios to upgrade your system:

First Scenario

Typically, you perform an in-place upgrade of an existing system. This upgrade scenario is supported for servers running Parallels Virtuozzo Containers 4.0 and 4.6 and is described in **Upgrading from Parallels Virtuozzo Containers 4.0 and 4.6 (p. 8).**

Second Scenario

You want to upgrade the Host operating system (Host OS) installed on your server together with the Parallels Virtuozzo Containers software running on it. In this case, follow these steps:

1. Back up all important Virtuozzo and Container configuration files.
2. Reinstall the Host operating system on the server.
3. Install Parallels Virtuozzo Containers 4.7 on the server.
4. Restore the backed up Virtuozzo and Container configuration files.

Detailed information on this scenario is given in **Upgrading Host Operating Systems with Parallels Virtuozzo Containers** (p. 11).

Third Scenario

You have a spare server to perform a new Parallels Virtuozzo Containers 4.7 installation. In this case, follow these steps:

1. Install Parallels Virtuozzo Containers 4.7 on the spare server. If the license that you own is in the old license format, refer to the **Upgrading License Manually** section below for a way to upgrade the license to the Parallels Virtuozzo Containers 4.7 format; then use it during a fresh installation.
2. Migrate all Containers from the Hardware Node you want to upgrade to the spare server.
3. If you store the Container (called Virtual Environment in SWsoft Virtuozzo 3.5.1 Service Pack 1) backups on the same Hardware Node, copy the backup folder to the spare server.
4. Check that all the Containers on the spare server can be started and stopped. To do this, use Parallels Virtual Automation, Parallels Management Console, and Parallels command-line utilities.

5 Reinstall the operating system on the Hardware Node.

6 Install Parallels Virtuozzo Containers 4.7 on the Hardware Node.

7 Migrate the Containers back from the spare server to the Hardware Node, if necessary.

Consult the *Parallels Virtuozzo Containers 4.7 User's Guide* and *Parallels Virtuozzo Containers 4.7 Installation Guide* for detailed information on how to migrate Containers between Hardware Nodes and to perform a clean installation of Parallels Virtuozzo Containers 4.7, respectively.

Upgrade Specifics

When upgrading the Hardware Nodes included in a Virtuozzo Group (called the Virtuozzo cluster in SWsoft Virtuozzo 3.5.1 Service Pack 1), do the following:

1 Upgrade all Slave Nodes in the Group.

2 Upgrade the Master Node.

CHAPTER 3

Preparing for the Upgrade

It is recommended that you do the following before starting the upgrade:

- Install all Parallels updates available for your system.
- Back up all Containers and virtual machines on the server.
- Perform a full backup of the entire server using a third-party software. For example, you can make use of the Acronis Backup & Recovery 10 Advanced Server (a free trial version is available at http://www.acronis.com/backup-recovery/advanced-server) software allowing you to quickly create an exact copy of your server and to easily restore the entire system if something goes wrong during the upgrade.

CHAPTER 4

Upgrading from Parallels Virtuozzo Containers 4.0 and 4.6

Parallels Virtuozzo Containers 4.7 officially supports an in-place upgrade on Hardware Nodes that run Parallels Virtuozzo Containers 4.0 or 4.6 and one of the following Linux distributions (both x86 and x64 versions):

- Red Hat Enterprise Linux 5
- CentOS 5

It is recommended that you install the latest Parallels Virtuozzo Containers update on the Hardware Node before starting the upgrade procedure. Use the `vzup2date` utility to check that you have all of the available updates installed on the Node.

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Upgrading to Parallels Virtuozzo Containers 4.7

To upgrade your system to Parallels Virtuozzo Containers 4.7, do the following:

1. Download the `vzinstall-linux-i386.bin` or `vzinstall-linux-x86_64.bin` utility (for the x86 or x86-64 version of Parallels Virtuozzo Containers 4.7, respectively) from the Parallels web site.

   The process of downloading and installing Parallels Virtuozzo Containers 4.7 with the `vzinstall-linux-i386.bin` and `vzinstall-linux-x86_64.bin` utilities is the same. Therefore, we use a generic term `vzinstall-linux.bin` to indicate both utilities throughout this document.

2. Run the `chmod a+x vzinstall-linux.bin` command to make the `vzinstall-linux.bin` utility executable.

3. Execute the `vzinstall-linux.bin` utility. You can run `vzinstall-linux.bin` in one of the following modes:

   - In the 'Download and install' mode, the utility automatically starts the upgrade after it has downloaded the Parallels Virtuozzo Containers 4.7 installation files to the server.
   - In the 'Download only' mode, the utility only downloads theParallels Virtuozzo Containers 4.7 installation files but does not install them on the server. You can copy the downloaded files to the server you plan to upgrade to Parallels Virtuozzo Containers 4.7 and execute the following command:

```
# ./virtuozzo-4.7.0-<build_version>-<arch>.sfx
```

   Detailed information on the `vzinstall-linux.bin` utility is provided in the *Parallels Virtuozzo Containers 4.7 Installation Guide*.

During the upgrade, you will have to complete the same steps as those described in the *Parallels Virtuozzo Containers 4.7 Installation Guide* for installing Parallels Virtuozzo Containers 4.7 on a fresh Linux distribution. Consult this guide if you need more information about specific steps.

Verifying the Upgrade

Follow these steps to verify that your system has been successfully upgraded to Parallels Virtuozzo Containers 4.7:

- Check that you can log in to the Hardware Node using Parallels tools: Parallels Virtual Automation (former Parallels Infrastructure Manager and Virtuozzo Control Center) and Parallels Management Console (former Virtuozzo Management Console).
- Check that all Containers (formerly Virtual Environments) on the Hardware Node can be started and stopped (using Parallels Virtual Automation, Parallels Management Console, and command-line utilities).
- Check that you can log in to Containers using Parallels Power Panel (former Virtuozzo Power Panels).

CHAPTER 5

Upgrading Host Operating Systems with Parallels Virtuozzo Containers

Along with upgrading the Parallels Virtuozzo Containers software, you may also wish to upgrade the Host operating system (Host OS) installed on your server. The following table lists the types of Host OS+Parallels Virtuozzo Containers (both Virtuozzo 3.0 Service Pack 1 and Parallels Virtuozzo Containers 4.0 or 4.6) upgrades officially supported in Parallels Virtuozzo Containers 4.7:

Host OS before upgrade	**Host OS after upgrade**
CentOS 4	CentOS 6 (recommended) CentOS 5
Red Hat Enterprise Server 4	Red Hat Enterprise Server 6 (recommended) Red Hat Enterprise Linux 5

The procedure of upgrading Host OSs slightly differs depending on the Virtuozzo version installed on the server and is described below.

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Upgrading a Host OS with Virtuozzo 3.0

To upgrade a server that runs one of the supported Host OSs and Virtuozzo 3.0 Service Pack 1, do the following:

1. Back up all Virtuozzo and Container configuration files. These are the following files:
   - `/etc/sysconfig/vz-scripts/*.conf`
   - `/etc/sysconfig/vz-scripts/*.mount`
   - `/etc/sysconfig/vz-scripts/*.umount`
   - `/etc/vz/*`
   - `/etc/sysconfig/vz`
   - `/etc/cron.d/venetclean`
   - `/etc/cron.d/vereboot`

   You can back up these files to any location. For example, you can just copy them to the `/vz/conf` partition that is left intact during the upgrade.
2. As with any major changes to the hard disk, it is highly recommended that you do the following before starting the upgrade:
   a. Back up all Containers (former Virtual Environments) on the Hardware Node.
   b. Perform a full backup of the entire Virtuozzo server using a third-party software. For example, you can make use of the Acronis Backup & Recovery 10 Advanced Server (a free trial version is available at http://www.acronis.com/backup-recovery/advanced-server) software allowing you to quickly create an exact copy of your server and to easily restore the entire system if something goes wrong during the upgrade.
3. Reinstall the Host operating system on the server. When reinstalling the system, make sure that the `/vz` partition is left intact. Once the installation is complete, restart the server.
4. Install Parallels Virtuozzo Containers 4.7. For detailed information on installing Parallels Virtuozzo Containers 4.7, see the *Parallels Virtuozzo Containers 4.7 Installation Guide*. Once the installation is complete, restart the server.
5. Restore the Virtuozzo and Container configuration files you backed up in **Step 1**:
   - Restore the `vz` Virtuozzo global configuration file to the `/etc/sysconfig` directory.
   - Restore the files `/etc/sysconfig/vz-scripts/*.conf`, `/etc/sysconfig/vz-scripts/*.mount`, and `/etc/sysconfig/vz-scripts/*.umount` to the `/etc/sysconfig/vz-scripts` directory.
   - Restore the contents of the `/etc/vz/*` directory to the `/etc/vz` directory.
   - Restore the files `/etc/cron.d/venetclean` and `/etc/cron.d/vereboot` to the `/etc/cron.d` directory.
6. Drop the quota currently set for Containers, and recalculate it:

```
# for i in $(ls /vz/root) ; do vzquota drop “${i}” ; done
# service vz restart
```

Upgrading a Host OS with Parallels Virtuozzo Containers 4.0 or 4.6

To upgrade a server that runs one of the supported Host OSs and Parallels Virtuozzo Containers 4.0 or 4.6, do the following:

1. Back up all Virtuozzo and Container configuration files. These are the following files:
   - `/etc/sysconfig/vz-scripts/*.conf`
   - `/etc/sysconfig/vz`
   - `/etc/vz/*`
   - `/etc/cron.d/venetclean`
   - `/etc/cron.d/vereboot`

   You can back up these files to any location. For example, you can just copy them to the `/vz/conf` partition that is left intact during the upgrade.
2. As with any major changes to the hard disk, it is recommended that you do the following before starting the upgrade:
   a. Back up all Containers (former Virtual Environments) on the Hardware Node.
   b. Perform a full backup of the entire Virtuozzo server using a third-party software. For example, you can make use of the Acronis Backup & Recovery 10 Advanced Server (a free trial version is available at http://www.acronis.com/backup-recovery/advanced-server) software allowing you to quickly create an exact copy of your server and to easily restore the entire system if something goes wrong during the upgrade.
3. Reinstall the Host operating system on the server. When reinstalling the system, make sure that the `/vz` partition is left intact. Once the installation is complete, restart the server.
4. Install Parallels Virtuozzo Containers 4.7. For detailed information on installing Parallels Virtuozzo Containers 4.7, see the *Parallels Virtuozzo Containers 4.7 Installation Guide*. Once the installation is complete, restart the server.
5. Restore the Virtuozzo and Container configuration files you backed up in **Step 1**:
   - Restore the `vz` Virtuozzo global configuration file to the `/etc/sysconfig` directory.
   - Restore the `/etc/sysconfig/vz-scripts/*.conf` file to the `/etc/sysconfig/vz-scripts` directory.
   - Restore the contents of the `/etc/vz/*` directory to the `/etc/vz` directory.
   - Restore the files `/etc/cron.d/venetclean` and `/etc/cron.d/vereboot` to the `/etc/cron.d` directory.
6. Restart the Virtuozzo service:

```
# service vz restart
```

CHAPTER 6

Upgrading Nodes in Clusters

This chapter describes how to upgrade nodes running Parallels Virtuozzo Containers 4.0, Parallels Virtuozzo Containers 4.6, or SWsoft Virtuozzo 3.0 with Service Pack 1 and participating in two types of clusters:

- failover clusters
- data sharing clusters

Note: Due to discontinued support in Red Hat Enterprise Linux 6, Parallels Virtuozzo Containers 4.7 no longer supports keeping `/vz` partitions on GFS1 volumes.

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Upgrading Nodes in a Failover Cluster

The process of upgrading nodes in a failover cluster includes the following steps:

1 Upgrading active nodes in the cluster.

2 Upgrading passive nodes in the cluster.

Important! Upgrade one cluster node at a time. Upgrading more than one node simultaneously is not supported and may damage your systems.

Checking Clustered Services

Each active node must be upgraded together with the clustered service running on it. So before starting the upgrade procedure, make sure that you know which clustered service is running on which node. To see the list of clustered services and the nodes where they are running, run this command on any of your cluster nodes:

```
# clustat
Service Name     Owner (Last)        State
 ------- ----    ----- ------        -----
 service:vz-0    server1.com         started
 service:vz-1    server2.com         started
```

Once you upgrade all active nodes in the cluster, no clustered services must be left un-upgraded.

Upgrading Active Nodes in the Cluster

First, you need to upgrade all active nodes in the failover cluster. To upgrade an active node, do the following:

1 Freeze the clustered service running on the active node:

```
# clusvcadm -Z clustered_service_name
```

(where *clustered_service_name* is the name of the clustered service)

If your version of `clusvcadm` does not support the `-Z` option, use the `-l` option instead. This option prevents the specified clustered service from running on a local node (that is, on the node where you run the command). If you use the `-l` option, execute the command on all cluster nodes (both active and passive), except for the node you are upgrading.

2 Open the `/etc/fstab` file on the node for editing, and add the `/vz` entry to it. Make sure you add the right `/vz` entry to the file:

a Run the `clustat` utility to find out the name of the clustered service running on the active node.

b Search the cluster configuration file (`/etc/cluster/cluster.conf`) for the UUID of the device associated with the clustered service, for example:

```
# cat /etc/cluster/cluster.conf
...
```

```
<service autostart="1" exclusive="1" name="vz-1" recovery="relocate">
                <fs device="UUID=39028daf-0337-4403-9567-84507ac7cb50" force_fsck="0"
force_unmount="0" fstype="ext3" mountpoint="/vz" name="fs-vz-1" options=""
self_fence="0">
...
```

In this example, the `vz-1` clustered service is associated with the device UUID `UUID=39028daf-0337-4403-9567-84507ac7cb50`.

c Add the `/vz` entry to `/etc/fstab`. For the example above, this string will look like the following:

```
UUID="39028daf-0337-4403-9567-84507ac7cb50" /vz ext3 _netdev,defaults,noatime 0 0
```

Be sure to add the `_netdev` and `noatime` options to the entry.

3 Disable the startup of the `rgmanager` and `cman` clustering services, and enable the startup of the `vz` service:

```
# chkconfig rgmanager off
# chkconfig cman off
# chkconfig vz on
```

4 Install Parallels Virtuozzo Containers 4.7 on the node. For detailed information on installing Parallels Virtuozzo Containers 4.7, see the *Parallels Virtuozzo Containers 4.7 Installation Guide*; for upgrade details, see the **Upgrading from SWsoft Virtuozzo 3.0 Service Pack 1** and **Upgrading from Parallels Virtuozzo Containers 4.0 and 4.6** (p. 8) chapters.

5 Once the installation is complete, restart the node, and wait for the Parallels Virtual Automation application to get upgraded.

6 Enable the startup of the `cman` and `rgmanager` services, and disable the startup of the `vz`, `pvapp`, and `pvaagentd` services:

```
# chkconfig cman on
# chkconfig rgmanager on
# chkconfig vz off
# chkconfig pvapp off
# chkconfig pvaagentd off
```

7 Open the `/etc/fstab` file for editing, and remove the `/vz` entry from it.

Upgrading Passive Nodes in the Cluster

Now that you have upgraded all active nodes in the cluster, you can proceed with upgrading passive nodes. To upgrade a passive node, do the following:

1 Make sure that the node does not have a `/vz` partition mounted.

2 Install Parallels Virtuozzo Containers 4.7 on the node (see instructions below). When installing Parallels Virtuozzo Containers 4.7 on a passive node, pay attention to the following:

a Use the `--clustermode` option when installing Parallels Virtuozzo Containers on passive nodes:

- If you use the `vzinstall-linux.bin` utility, run this command:

```
# ./vzinstall-linux-x86_64.bin install --vzinstall-opts "--clustermode"
```

- If you use the `install` utility, run this command:

```
# ./install --clustermode
```

a If you used the Parallels Infrastructure Manager application for administering your cluster nodes, you also need to upgrade this application. First of all, update Parallels Infrastructure Manager to its latest version. When installing Parallels Virtuozzo Containers 4.7, specify the `--pva-agent` option, for example:

```
# ./vzinstall-linux-x86_64.bin install --vzinstall-opts "--clustermode --pva-agent"
```

or

```
# ./install --clustermode --pva-agent
```

3 Disable the startup of the `pvapp` and `pvaagentd` services:

```
# chkconfig pvapp off
# chkconfig pvaagentd off
```

For detailed information on installing Parallels Virtuozzo Containers 4.7, see the *Parallels Virtuozzo Containers 4.7 Installation Guide*. For upgrade details, see the **Upgrading from SWsoft Virtuozzo 3.0 Service Pack 1** and **Upgrading from Parallels Virtuozzo Containers 4.0 and 4.6** (p. 8) chapters.

Finishing the Upgrade

Once you upgrade all active and passive nodes, configure the cluster configuration file (`/etc/cluster/cluster.conf`) as follows:

1 Add to the `<resources>` section these lines:

```
<script file="/etc/init.d/pvaagentd" name="pvascr"/>
<script file="/etc/init.d/pvapp" name="ppscr"/>
```

2 Add to the `<service>` section of each clustered service these lines:

```
<script ref="pvascr"/>
<script ref="ppscr"/>
```

3 Increase the value of the `config_version` parameter by 1.

4 Save the file, and run the `ccs_tool` utility to update the cluster configuration.

5 Restart all cluster nodes one by one.

Finally, you need to unfreeze the clustered services on all active nodes:

```
# clusvcadm -U clustered_service_name
```

If you used the `-l` option to lock the clustered service, specify the `-u` option after `clusvcadm` to unlock the service. Unlock all services on all nodes where you locked them.

Upgrading Nodes in a Data Sharing Cluster

Like it is the case with a failover cluster, the process of upgrading nodes in a data sharing cluster also includes two steps:

1. Upgrading active nodes in the cluster.
2. Upgrading passive nodes in the cluster.

However, each of these steps contains additional operations that you need to perform to upgrade cluster nodes.

Important!

1. Upgrade one cluster node at a time. Upgrading more than one node simultaneously is not supported and may damage your system.

2. Due to discontinued support in Red Hat Enterprise Linux 6, Parallels Virtuozzo Containers 4.7 no longer supports keeping `/vz` partitions on GFS1 volumes.

Checking Clustered Services

Each active node must be upgraded together with the clustered service running on it. So before starting the upgrade procedure, make sure that you know which clustered service is running on which node. To see the list of clustered services and the nodes where they are running, run this command on any cluster node:

```
# clustat
Service Name     Owner (Last)        State
 ------- ----    ----- ------        -----
 service:vz-0    server1.com         started
 service:vz-1    server2.com         started
```

Once you upgrade all active nodes in the cluster, no clustered services must be left un-upgraded.

Upgrading Active Nodes in the Cluster

First, you need to upgrade all active nodes in the data sharing cluster. To upgrade an active node:

1. Freeze the clustered service running on all active nodes in the cluster. To do this, run the following command on each active node:

```
# clusvcadm -Z clustered_service_name
```

   (where *`clustered_service_name`* is the name of the clustered service)

   If your version of `clusvcadm` does not support the `-Z` option, use the `-l` option instead. This option prevents the specified clustered service from running on a local node (that is, on the node where you run the command). If you use the `-l` option, execute the command on all cluster nodes (both active and passive), except for the node you are upgrading.

2 Disable the startup of the `rgmanager` clustering service, and enable the startup of the `vz` service:

```
# chkconfig rgmanager off
# chkconfig vz on
```

If you are upgrading a node running SUSE Linux Enterprise Server, you need to additionally disable the `openais` service:

```
# chkconfig openais off
```

3 Install Parallels Virtuozzo Containers 4.7 on the node. For detailed information on installing Parallels Virtuozzo Containers 4.7, see the *Parallels Virtuozzo Containers 4.7 Installation Guide*; for upgrade details, see the **Upgrading from SWsoft Virtuozzo 3.0 Service Pack 1** and **Upgrading from Parallels Virtuozzo Containers 4.0 and 4.6** (p. 8) chapters.

4 Once the installation is complete, restart the node, and wait for the Parallels Virtual Automation application to get upgraded. To make sure that the Parallels Virtual Automation upgrade is complete, check that the `pva-setup` process is absent from the list of processes running on the node.

5 Enable the startup of the `rgmanager` service, and disable the startup of the `vz`, `pvapp`, and `pvaagentd` services:

```
# chkconfig rgmanager on
# chkconfig vz off
# chkconfig pvapp off
# chkconfig pvaagentd off
```

Upgrading Passive Nodes in the Cluster

Now that you have upgraded all active nodes in the cluster, you can proceed with upgrading passive nodes. To upgrade a passive node, do the following:

1 Make sure that the node does not have a `/vz` partition mounted. If it does, unmount the partition.

2 Comment the `/vz` entry in the `/etc/fstab` file.

3 Disable the startup of the `cman` and `rgmanager` services, and enable the startup of the `vz` service:

4 Make sure that all NFS-related services are enabled on the node:

```
# chkconfig rgmanager off
# chkconfig cman off
# chkconfig vz on
```

5 Install Parallels Virtuozzo Containers 4.7 on the node:

a Use the `--clustermode` option when installing Parallels Virtuozzo Containers 4.7 on passive nodes:

- If you use the `vzautoinstall` utility, run this command:

```
# ./vzinstall-linux-x86_64.bin install --vzinstall-opts "--clustermode"
```

- If you use the `install` utility, run this command:

```
# ./install --clustermode
```

a If you used the Parallels Infrastructure Manager application (renamed to Parallels Virtual Automation in Parallels Virtuozzo Containers 4.7) for administering your cluster nodes, you also need to upgrade this application. First of all, update Parallels Infrastructure Manager to its latest version. When installing Parallels Virtuozzo Containers 4.7, specify the `--pva-agent` option, for example:

```
# ./vzinstall-linux-x86_64.bin install --vzinstall-opts "--clustermode --pva-agent"
```

or

```
# ./install --clustermode --pva-agent
```

6 Once the installation is complete, restart the node. If you chose to upgrade Parallels Virtual Automation, wait for it to get upgraded.

7 Make sure that the `/vz` directory does not contain any files or folders.

8 Uncomment the `/vz` entry to the `/etc/fstab` file.

9 Enable the startup of the `cman` and `rgmanager` services, and disable the startup of the `vz`, `pvapp`, and `pvaagentd` services:

```
# chkconfig cman on
# chkconfig rgmanager on
# chkconfig vz off
# chkconfig pvapp off
# chkconfig pvaagentd off
```

For detailed information on installing Parallels Virtuozzo Containers 4.7, see the *Parallels Virtuozzo Containers 4.7 Installation Guide*. For upgrade details, see **Upgrading from SWsoft Virtuozzo 3.0 Service Pack 1** and **Upgrading from Parallels Virtuozzo Containers 4.0 and 4.6** (p. 8).

Finishing the Upgrade

Once you upgrade all active and passive nodes, configure the cluster configuration file (`/etc/cluster/cluster.conf`) as follows:

1 Add to the `<resources>` section these lines:

```
<script file="/etc/init.d/pvaagentd" name="pvascr"/>
<script file="/etc/init.d/pvapp" name="ppscr"/>
```

2 Add to the `<service>` section of each clustered service these lines:

```
<script ref="pvascr"/>
<script ref="ppscr"/>
```

3 Increase the value of the `config_version` parameter by 1.

4 Save the file, and run the `ccs_tool` utility to update the cluster configuration.

5 Restart all cluster nodes one by one.

Finally, you need to unfreeze the clustered services on all active nodes:

```
# clusvcadm -U clustered_service_name
```

If you used the `-l` option to lock the clustered service, specify the `-u` option after `clusvcadm` to unlock the service. Unlock all services on all nodes where you locked them.

CHAPTER 7

Upgrading from OpenVZ

Parallels Virtuozzo Containers 4.7 allows you to upgrade servers running OpenVZ (www.openvz.org) to Parallels Virtuozzo Containers 4.7. To do this:

1. Update OpenVZ to its latest version. You can download the latest versions of OpenVZ packages from http://download.openvz.org.
2. Back up all OpenVZ and Container configuration files. These are the following files:
   - `/etc/sysconfig/vz-scripts/*.conf`
   - `/etc/sysconfig/vz-scripts/*.mount`
   - `/etc/sysconfig/vz-scripts/*.umount`
   - `/etc/vz/*`
   - `/etc/sysconfig/vz`
   - `/etc/cron.d/venetclean`
   - `/etc/cron.d/vereboot`

   You can back up these files to any location. For example, you can just copy them to the `/vz/conf` partition that is left intact during the upgrade.
3. As with any major changes to the hard disk, it is highly recommended that you do the following before starting the upgrade:
   a. Back up all Containers (former Virtual Environments) on the Hardware Node.
   b. Perform a full backup of the entire Virtuozzo server using a third-party software. For example, you can make use of the Acronis Backup & Recovery 10 Advanced Server (a free trial version is available at http://www.acronis.com/backup-recovery/advanced-server) software allowing you to quickly create an exact copy of your server and to easily restore the entire system if something goes wrong during the upgrade.
4. Reinstall the Host operating system on the server. When reinstalling the system, make sure that the `/vz` partition is left intact. Once the installation is complete, restart the server. Install one of the following operating systems: Red Hat Enterprise Linux 6 (recommended), CentOS 6 (recommended), Red Hat Enterprise 5, or CentOS 5.
5. Install Parallels Virtuozzo Containers 4.7. For detailed information on installing Parallels Virtuozzo Containers 4.7, see the *Parallels Virtuozzo Containers 4.7 Installation Guide*. Once the installation is complete, restart the server.
6. Restore the OpenVZ and Container configuration files you backed up in **Step 1**:
   - Restore the `vz` Virtuozzo global configuration file to the `/etc/sysconfig` directory.

- Restore the files `/etc/sysconfig/vz-scripts/*.conf`, `/etc/sysconfig/vz-scripts/*.mount`, and `/etc/sysconfig/vz-scripts/*.umount` to the `/etc/sysconfig/vz-scripts` directory.
- Restore the contents of the `/etc/vz/*` directory to the `/etc/vz` directory.
- Restore the files `/etc/cron.d/venetclean` and `/etc/cron.d/vereboot` to the `/etc/cron.d` directory.

7 Drop the quota currently set for Containers, and recalculate it:

```
# for i in $(ls /vz/root) ; do vzquota drop “${i}” ; done
# service vz restart
```

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Performing Post-Upgrade Operations

Use the guidelines below to configure your system once the upgrade is complete.

Installing Templates

During the upgrade, the SimFS filesystem used by OpenVZ Containers is converted to VZFS used by Containers in Parallels Virtuozzo Containers 4.7. As a result, you cannot use old OS templates on upgraded Nodes to create new Containers. To be able to create new Containers, you need first to install OS templates used in Parallels Virtuozzo Containers 4.7 and called EZ templates. To install an OS EZ template, execute the `vzup2date -z` command on the server, and follow the on-screen instructions. For detailed information on the `vzup2date` utility, see the **Downloading and Installing EZ Templates with vzup2date** section in the *Parallels Virtuozzo Containers 4.7 Templates Management Guide*.

Once you install an OS EZ template, you can create a new Container on its basis using the `--ostemplate` option of the `vzctl create` command. For detailed information on creating Containers, see the *Parallels Virtuozzo Containers 4.7 User's Guide*.

Upgrading Existing Containers

Upgraded Containers continue using old OS templates after the upgrade. To make existing Containers fully compatible with Parallels Virtuozzo Containers 4.7, you need to install the new EZ OS templates that correspond to the OS templates used by OpenVZ Containers. For example, if a Container was based on the CentOS 4 OpenVZ template, install the CentOS 4 EZ OS template on the server. Once you install an OS EZ template used by a Container, the Container automatically starts using this template instead of the old one.

To download and install OS EZ templates, execute the `vzup2date -z` command on the server, and follow the on-screen instructions. For detailed information on the `vzup2date` utility, see the **Downloading and Installing EZ Templates with vzup2date** section in the *Parallels Virtuozzo Containers 4.7 Templates Management Guide*.

Once you install an OS EZ template, you are recommended to run the `vzpkg link` *`CT_ID`*. command. When executed, this command replaces real files in the Container private area with symlinks to these very files on the server. This can free megabytes of disk space on the server. For more information on using the `vzpkg link` command, see the **Cleaning Up Containers** section in the *Parallels Virtuozzo Containers 4.7 User's Guide*.

Configuring Virtual Ethernet Network Adapters

If any of your Containers were operating in the bridged mode (that is, had one or more virtual Ethernet adapters configured) before the upgrade, you need to re-configure these Containers once the upgrade is complete. To do this:

1. Roll back all changes you made when configuring bridge interfaces and virtual Ethernet adapters on the server with OpenVZ. If you do not remember exactly what settings you changed, consult the manual at http://wiki.openvz.org/VEs_and_HNs_in_same_subnets.
2. Configure the networking on the upgraded server. This includes the following steps:
   a. Creating one or more Virtual Networks on the server (a counterpart of bridge interfaces in OpenVZ).
   b. Making virtual network adapters for Containers.
   c. Adding Containers to the created Virtual Networks.

   For detailed information on each of these steps, see the **Managing Parallels Virtuozzo Containers Network** chapter in the *Parallels Virtuozzo Containers 4.7 User's Guide*.

CHAPTER 8

Rolling Back to a Previous Version

This section describes how to roll back an unsuccessful upgrade from Parallels Virtuozzo Containers 4.7 to Parallels Virtuozzo Containers 4.6, Parallels Virtuozzo Containers 4.0, or Virtuozzo 3.0 Service Pack 1.

If the upgrade was unsuccessful, use one of the following ways to return the system to its original state:

- If you created a backup of the entire Hardware Node (for example, using the Acronis® True Image Echo™ Enterprise Server software) before the upgrade, perform a full system restore by following the instructions given in the corresponding product documentation.
- If you backed up all Containers (former Virtual Environments) that existed on the Hardware Node before the upgrade, but did not create a full backup of the Hardware Node, do the following:
  - **a** Reinstall the Linux distribution on the Node.
  - **b** Install the original version of the product on the Node (Virtuozzo 3.0 Service Pack 1, Parallels Virtuozzo Containers 4.0, or Parallels Virtuozzo Containers 4.6).
  - **c** Restore the Containers from their backups.

Before starting the rollback operation, run the `vzreport` utility to contact the Parallels support team and inform it of the problem you have encountered. This utility automatically collects the necessary logs, network, system, and troubleshooting information into a single file and downloads it to the Parallels technical support server. `vzreport` does not send your private information to Parallels.

If it is impossible to make use of the `vzreport` utility, please back up the log files generated during the upgrade procedure and send them to the Parallels support team. Please provide the support team with the following log files:

- `/var/log/vzsveupgrade.log`
- `/root/vzinstall.log` (if you performed the upgrade using the `install` utility)
- `/root/virtuozzo/vzautoinstall.log` (if you performed the upgrade using the `vzinstall-linux.bin` utility)

CHAPTER 9

Getting Technical Support

If you experience any problems related to upgrading your software to Parallels Virtuozzo Containers 4.7, do the following:

- If you have a Customer Relationship manager or a dedicated support engineer assigned to your company, please feel free to contact them for any questions related to the Parallels Virtuozzo Containers 4.7 upgrade.
- In all other cases, use one of the following ways to get technical support from Parallels (available 24/7 via email and phone):
  - Open a support ticket by filling in a special support form at https://www.parallels.com/en/support/virtuozzo/request/ or submitting a support request using the `vzreport` utility. You can then use the Parallels Support RT self-service interface available at https://support.parallels.com to open and track your ticket.
  - If your support plan includes phone assistance, call 866.248.8906 (toll-free for US and Canada customers) or +1.703.286.2196 (internationally).

Problem Escalation

We make every effort to ensure that your problems are processed quickly and effectively. If, however, there are delays in processing your ticket past the time period that is stated in your support contract, you may escalate the problem by writing a letter to `escalation@parallels.com`. This email address is checked by the support leaders on a 24x7 basis. Please send the ticket ID in your email for us to be able to review the status of your ticket and adjust the priority, if necessary. Please note that the escalation channel is not meant to provide the support service. After you send an escalation request, the Parallels support team will either send you a response in the corresponding ticket by email or call you.